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AGRICULTURE
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MARKETING
MAIN - CROP
POTATOES



THE WISE OR UNWISE marketing of the potato crop may easily mean a difference of millions of dollars in the farmers' income in a year. When every principle of intelligent production has been applied and bountiful yields obtained, all profit is too often sacrificed when the crop is sold.

The potato is foremost in value among our vegetables. It is the chief money crop of large areas, an important staple in many others, and is grown for home supply and local markets in almost every farming district.

This bulletin discusses some of the underlying facts and conditions that influence prices, the sources and character of the information the grower should use, and the differing marketing problems of the producers of the late or main crop. The location, shipping season, and relative importance of the heavy shipping districts are shown, with brief descriptions of the methods of marketing pursued in typical areas.

MARKETING MAIN-CROP POTATOES.

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THE MAIN OR LATE-POTATO REGION.

THE LATE or main crop of potatoes comprises about four-fifths of the total production. As compared with the early crop, the most important feature is its keeping quality, which permits its sale and use all winter and through the early summer of the following year, thus requiring different methods of marketing.

The main-crop region extends from Maine westward to Washington, and southward to northern New Jersey in the East, and to northern California in the West. The States along the southern border of the main-crop territory are somewhat intermediate in character. Thus, New Jersey is often classed as an early-shipping State and California as a main-crop State; both of them, however, are heavy-shipping sections in each class in varying proportions, according to season and market. Some of the late-producing States sell most of their market crop in small lots for local consumption. Only 15 States are prominent in late car-lot shipments. These, arranged according to the average yearly number of car-lot shipments, are Maine, Minnesota, Wisconsin, Michigan, New York, California, Colorado, Idaho, North Dakota, Washington, Pennsylvania, Nebraska, Oregon, South Dakota, and Montana. These States furnish all but a few thousand cars of the main-crop shipments. They move from 110,000 to 200,000 carloads and average about 90,000,000 bushels of potatoes each season.

WHAT IS DONE WITH THE CROP.

About 58 per cent of the combined early and late potato crop of 1919 was reported sold, according to the census returns. Evidently 42 per cent of the potato crop was retained on the farms. Allowing 10 per cent of the total crop for seed and 20 per cent more for shrink-

age, stock feed, and decay, there remained about $11\frac{1}{2}$ bushels per farm to be eaten by the people on the 3,000,000 farms which produce potatoes.

The census report says that only about one-half of the farms produce potatoes even for home use, so, evidently, part of the potatoes not sold in city markets are used on other farms. Apparently about one-third to one-half of the potatoes sold are not shipped in carload quantities, but are trucked directly to market or sold from the farms in small lots.

For the season 1919-1920 the shipments of potatoes were about 167,000 cars, aggregating over 100,000,000 bushels. If the car-lot shipments may be considered chiefly for city consumption and the

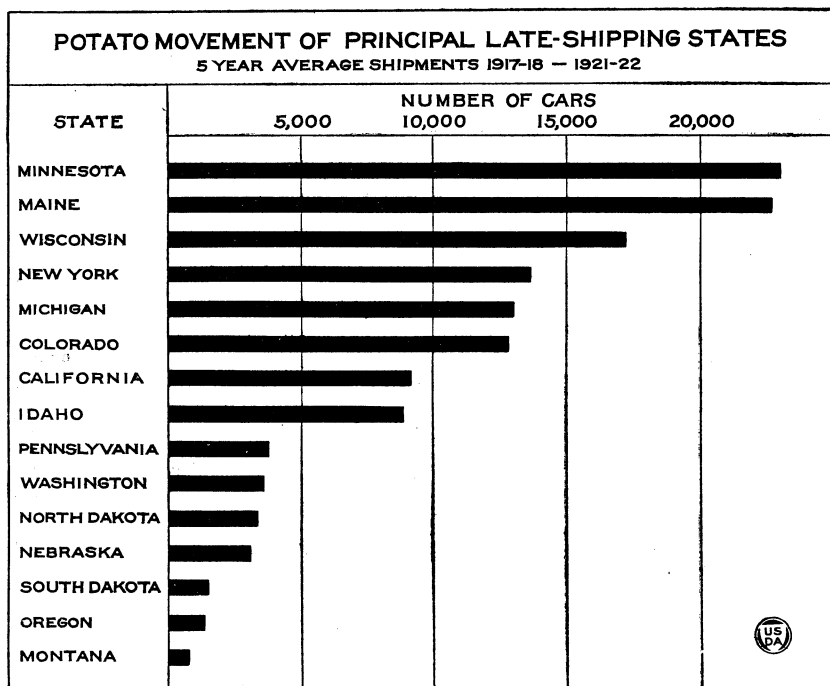


FIG. 1.—Relative importance of potato-shipping States.

small-lot sales to be consumed chiefly by the rural population, it would appear that city and country customers consume nearly equal quantities. It is plain that much the larger part of the crop is held in the country, but besides local sales and the requirements of the farm families, the country holdings include the greater part of the quantity accounted for by shrinkage, decay, feed for stock, and for seed.

The disposal of the average potato crop is indicated on a different basis in Figure 3, using the average of estimated crops 1917-1921. Making the same 30 per cent allowance for waste, seed, etc., and taking out about 25 per cent as shipped in car lots, there remains about 45 per cent of the crop to be sold in small lots and consumed on farms.

About half the total crop, then, is used on farms in one way or another, including losses and waste. The other half is sold, being disposed of in about equal proportions as car-lot shipments and as sales in small lots.

The marketing problem, which makes or breaks the grower, is really the problem of selling about half the potatoes actually grown. A part of the 10 per cent estimated as used for seed goes into the car-lot movement in addition to the 24.2 per cent credited mainly to city consumption.

PROPORTION OF THE CROP SHIPPED.

Table 1 shows the total production for each main-crop State, the number of carloads shipped from each State, and the percentage of the crop of each State which these shipments represent. The percentage of the crop shipped as carloads shows in a general way the extent to which the crop is grown for sale upon the general market through the usual channels of commercial distribution. Some of these figures have a vital bearing upon successful marketing.

TABLE 1.—Five-season average production, car-lot shipments, and percentage of potato shipments from main-crop States, 1917-18 to 1921-22 seasons.

HEAVY SHIPPING STATES.

| | Production. | | Car-lot shipments. | Percentage of crop shipped. |
|-------------------|---------------|----------------------|--------------------|-----------------------------|
| | Bushels. | Cars of 600 bushels. | | |
| Idaho..... | 7, 536, 800 | 12, 561 | 8, 896 | 70. 82 |
| Colorado..... | 11, 611, 000 | 19, 351 | 12, 814 | 66. 21 |
| Maine..... | 25, 120, 600 | 41, 868 | 22, 610 | 54. 07 |
| California..... | 11, 307, 800 | 18, 846 | 7, 358 | 39. 07 |
| Minnesota..... | 30, 870, 000 | 51, 450 | 22, 983 | 44. 46 |
| Nevada..... | 1, 097, 600 | 1, 829 | 742 | 40. 69 |
| Wisconsin..... | 30, 302, 000 | 50, 503 | 17, 218 | 34. 50 |
| North Dakota..... | 7, 256, 800 | 12, 095 | 3, 489 | 28. 04 |
| Washington..... | 8, 141, 200 | 13, 569 | 3, 728 | 27. 84 |
| Michigan..... | 30, 979, 000 | 51, 632 | 12, 976 | 25. 13 |
| New York..... | 36, 729, 000 | 61, 215 | 13, 690 | 22. 36 |
| Nebraska..... | 9, 039, 200 | 15, 065 | 3, 176 | 21. 08 |
| Oregon..... | 5, 458, 000 | 9, 096 | 1, 492 | 16. 40 |
| South Dakota..... | 6, 449, 000 | 10, 748 | 1, 644 | 15. 29 |
| Utah..... | 3, 003, 600 | 5, 006 | 675 | 13. 48 |
| Montana..... | 4, 781, 000 | 7, 968 | 849 | 10. 65 |
| Wyoming..... | 2, 917, 400 | 4, 862 | 480 | 9. 87 |
| Pennsylvania..... | 24, 961, 600 | 41, 603 | 3, 930 | 9. 44 |
| Total..... | 257, 561, 600 | 429, 267 | 138, 750 | 32. 32 |

LIGHT SHIPPING STATES.

| | Bushels. | Cars of 600 bushels. | Car-lot shipments. | Percentage of crop shipped. |
|--------------------|---------------|----------------------|--------------------|-----------------------------|
| Iowa..... | 8, 295, 200 | 13, 825 | 533 | 3. 85 |
| Vermont..... | 3, 260, 000 | 5, 433 | 130 | 2. 39 |
| New Hampshire..... | 2, 173, 400 | 3, 622 | 67 | 1. 84 |
| New Mexico..... | 620, 800 | 1, 035 | 16 | 1. 54 |
| Illinois..... | 8, 912, 600 | 14, 854 | 148 | . 99 |
| Ohio..... | 10, 598, 600 | 17, 664 | 161 | . 91 |
| Connecticut..... | 2, 454, 800 | 4, 091 | 20 | . 48 |
| West Virginia..... | 4, 876, 000 | 8, 293 | 26 | . 31 |
| Indiana..... | 6, 074, 000 | 10, 123 | 28 | . 27 |
| Massachusetts..... | 3, 803, 400 | 6, 339 | 16 | . 25 |
| Total..... | 51, 168, 800 | 85, 279 | 1, 145 | 1. 34 |
| Grand total..... | 308, 730, 400 | 514, 546 | 139, 895 | 27. 18 |

CAR LOT THE COMMERCIAL UNIT.

Potato growers measure their crops by the acre, the bushel, the barrel, or the 100 pounds. The commercial movement, however, is measured in carloads. A carload does not always mean the same number of bushels or barrels. Although many carloads of the late crop have run as high as 700 to 800 bushels, for the crop as a whole in average seasons and for the late crop separately 600 bushels, or 18 tons, is reckoned a carload.



FIG. 2.—Digging main-crop potatoes.

THE SELLING IDEA.

Marketing is comparatively simple when conditions favor the producer. Potatoes sell easily at fair prices when the supply is not excessive and the demand is active. Buyers are then looking for shipments, and any kind of stock—No. 1, No. 2, or ungraded—finds a ready market. But for the main potato crop such conditions prevail less than half the time. In seasons of heavy production and little speculative demand, when local buyers are hard to suit, only by skillful marketing can the producer hope to get satisfactory returns.

In any season a thorough knowledge of conditions that attend the marketing of potatoes offers a distinct advantage in buying or selling. The well-informed handler of potatoes knows a little better than his neighbors and competitors how and where to sell or buy. He may not be right on every occasion, but in the long run his trained judgment will give him the advantage. The practical ques-

tion for the grower is how to interpret potato-marketing history and apply its lessons to the selling of his crop from year to year.

Are there any facts or conditions upon which his marketing policy may be safely based?

Is there any market information he can use to aid him?

Can he hold his main crop for the late market with profit or are the risks too great?

Shall he accept the offer of his local buyer or seek a distant outlet?

How can he tell what growers in distant but competing territory are going to do?

Is it possible to foresee an unprofitable season in time to save storage and waste by selling early?

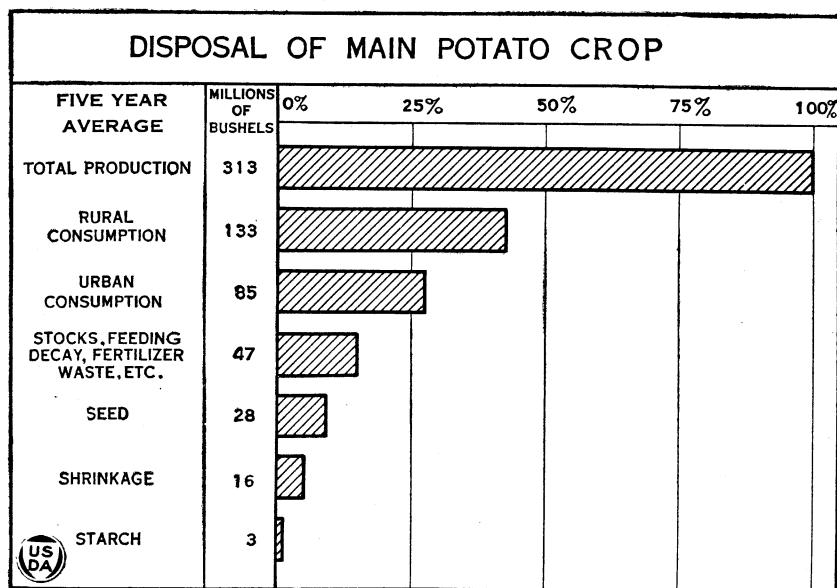


FIG. 3.—Rural consumption of potatoes is heavier than city consumption.

FORECASTING THE MARKET SEASON.

Signs of the probable trend of the coming potato market season appear as early as May, when planting is in progress, and reports of the United States Department of Agriculture indicate in a general way whether the season's acreage is more or less than usual. In average seasons the crop varies according to the acreage planted, but sometimes a large yield offsets a reduced acreage or crop injury causes shortage even from a large acreage. Accordingly, condition reports and crop forecasts must be followed month by month. Reports of poor crops in other sections should encourage the grower to take special care of his own fields in order to be in a position to obtain full advantage from the probable shortage. By August the situation becomes more clear; in September it is still more definite. The Government condition reports and forecasts appear soon after the first of each month and show the probable production.

During the last eight seasons in which the September forecast has been issued the September estimate has been a fairly good guide to indicate whether the crop would be large or small. The August estimate was also a valuable guide, although in most years less uniformly reliable than that of September and the later months.

The general rule (Fig. 4) is to sell as soon as ready for market when the crop is above the average or even when so near the average as to make the outcome seem doubtful. In uncertain cases waiting for later estimates might disclose the situation more clearly.

The rise or fall in winter prices has coincided remarkably with small or large crops, indicating that the frequent occurrence of a high-price season following one of low prices depends largely upon underlying tendency toward alternating large and small crops. As a rule, whenever production has approached or exceeded 4 bushels per capita the price has tended downward, but the price trend has

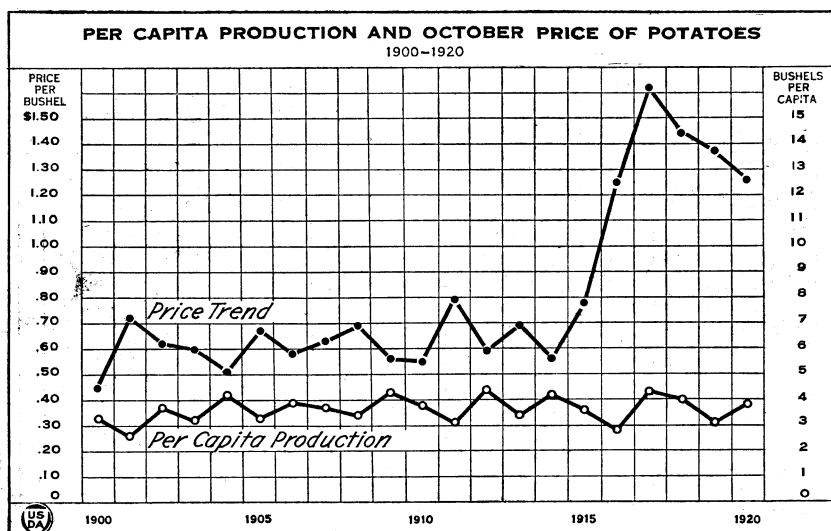


FIG. 4.—Potato prices move up and down, season to season, largely according to size of crop.

been upward whenever the average yield fell below 3.2 bushels per capita.

During the last 20 years the grower was apparently justified in holding only when the indicated crop was far below the average, or not much more than 3 bushels per capita. In other years the chance of profit to the grower was too uncertain to balance the added risk, cost, and shrinkage. The grower who acted according to early forecasts, selling at once when heavy yields were indicated, or selling at convenience in case of doubt, and holding only in very scarce seasons, apparently had a chance of being right three out of four times, judging from outcome of recent seasons. (See Fig. 5.)

PRICES IN THE MAKING.

While yield has the most important influence on prices, exceptions have occurred in periods of business depression and unemployment of labor. In such times, potatoes have shared with other commodities

the general price depression which accompanies hard times. Accordingly, in trying to fix at long range the probable trend of prices at least three main points must be considered. First, early in the season the increase or decrease of acreage; second, the total supply as indicated by yield, modified by prevalence of rot, disease, or freezing which may reduce the final amount available for marketing; and, third, probable market demand as indicated by business conditions. The situation will be affected somewhat by the indicated amount of competition with imported potatoes and with sweet potatoes. There is also at times competition between the old and new crops which are upon the markets together in April, May, and June.

Differences in prices in sections of the country are less than they were a few seasons ago when potato prices were far apart even in States located in the same region, like Michigan and Wisconsin. In the 1919-20 and 1920-21 seasons 25 cents per 100 pounds would often cover fairly well the day's differences in prices of potatoes between the principal sections, East and West.

This quick adjustment of values may reduce the old-time activities of speculators, but it improves the position of the average grower, dealer, and consumer. The completeness of the evening-up process depends upon the correct market news reaching everybody concerned.

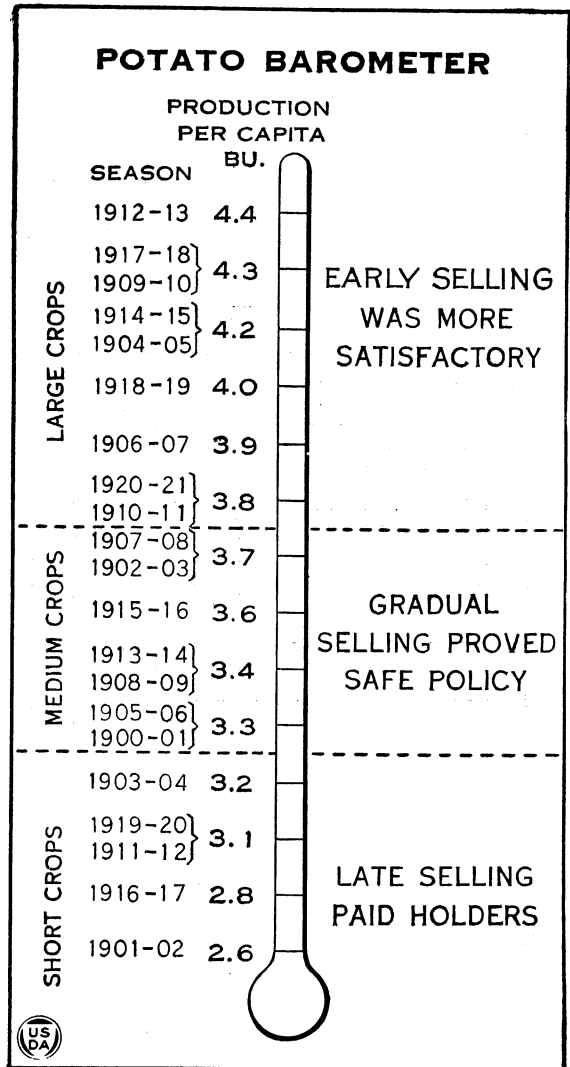


FIG. 5.—Relation of size of crops and selling policy.

SOURCES OF CROP AND MARKET NEWS.

The daily market news reports of the Bureau of Agricultural Economics are of value in many ways. The buyer as well as the grower shipping his own stock, should note the daily reports of potato shipments so as to forecast the supplies on the market. The shipping-point news supplies information on prices paid in competing sections. Prices in the city markets should be followed to determine when and where shipments should be sent for best returns, and for the purpose of checking up returns reported on sales already made.

The daily reports are summarized in a series of weekly summaries prepared for the newspapers and farm periodicals. For many farmers, the earliest reports of potato crop production, condition,

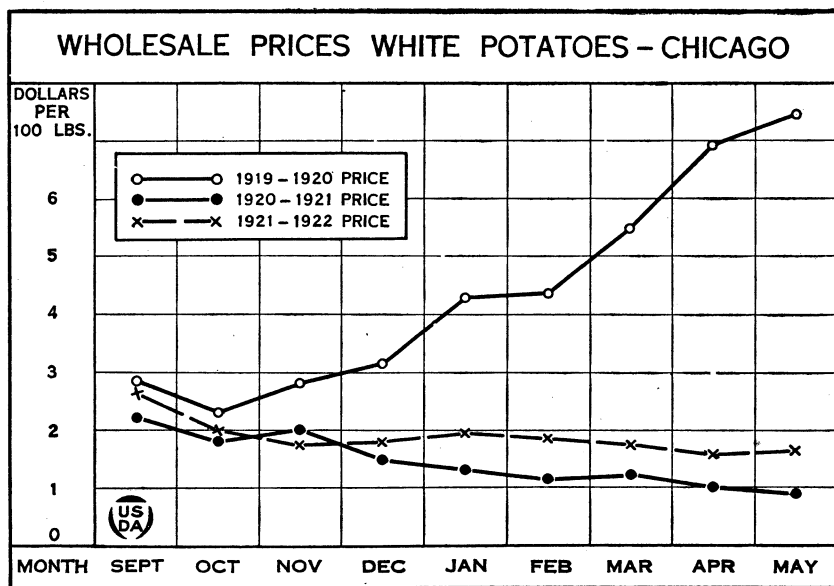


FIG. 6.—Wholesale prices of potatoes in Chicago, 1919 to 1922.

and market prices are from these summaries, published in the local paper.

Daily price reports on potatoes are sent out by the Bureau of Agricultural Economics in cooperation with more than 80 radio broadcasting stations.

This service is available at present in 36 States to all persons having receiving sets. Some large producers and dealers or associations receive reports by telephone or telegraph direct from field stations.

A weekly publication of the Department of Agriculture at Washington, called *Weather, Crops and Markets*, contains important potato crop and market information, including weekly market articles and the crop reports and estimates; all similar to the material published in the daily and weekly reports. This paper may be had

at \$1 per year of the Superintendent of Documents, Government Printing Office, Washington, D. C.

The other daily and weekly publications, including the potato crop forecasts, estimates, and reports, and the semimonthly crop notes issued about the 5th and 20th of each month showing the important changes in conditions affecting the crop, are sent free on request. Similar reports covering individual States in some detail are published by the agricultural departments at various State capitals.

The field stations from which shipping-point news is sent from the late-potato sections are: Waupaca, Wis., Grand Rapids, Mich., Minneapolis, Minn., Greeley, Colo., Idaho Falls, Idaho, Alliance, Nebr., Rochester, N. Y., and Presque Isle, Me. These stations open from the middle of September to the first of October and close early in April. Daily reports are sent out from the field stations during the season of operation and may be obtained on application to the Washington office or by applying about September 1 directly to the nearest field station. The market stations of the United States Department of Agriculture at New York, Philadelphia, Boston, Washington, Pittsburgh, Cincinnati, Chicago, St. Louis, Kansas City, Fort Worth, Minneapolis, and Los Angeles send out daily potato market reports of country wide scope throughout the year. They include the number of car-lot shipments and where from, the number of cars arriving at the principal cities, the prevailing range of prices or sales by receivers to jobbers or direct to retailers, the quality and condition of receipts, and the market and weather conditions.

Addresses of city dealers who handle large quantities of main-crop potatoes may be had from the market stations or from the department at Washington. The financial and business standing of any dealer may be investigated through the commercial credit books, through the local banks, or through special references which the dealer should be glad to supply on request.

USING THE PRICE RECORDS.

Farmers should keep the various reports together by crops, weeks, months, and shipping seasons, including tables, estimates, summaries, and car-lot statements received. These will be useful for reference, but the main-crop outline should be kept in mind, including production, quality, general market movement, and price range in recent seasons. With these as a background, the prices in leading markets and at shipping points will show which way the general market is going.

Prices are settled mainly where there is greatest sustained volume of sales. The larger markets are first to show the changes in price trend because of their constant activity and frequent sales of large lots. Their huge demands on available stock make them both indicators and regulators of prices.

WATCH LEADING LINES AND GRADES.

The leading varieties and grades sold in the big markets indicate the course of potato prices because they are always in steady demand and are salable in large quantities.

An occasional glance early in the season at quotations of No. 1 Florida Spaulding Rose in New York, or No. 1 Texas Bliss Triumph in Chicago, or, later, the Virginia and Kaw Valley Cobbler in New York, Pittsburgh, Chicago, and Kansas City will give a sufficient idea of the early market to a person interested chiefly in its relation to the main crop, for as the early crop is only about one-fifth of the total production and is not suitable for storage, it seems to have comparatively little effect on the price of the following main crop.

The intermediate crop from New Jersey, Idaho, Kansas, Nebraska, Minnesota, etc., competes to a certain degree with the early sales of the main crop and is worth watching, as foreshadowing to some extent the early price of the main crop. Prominent features of the mid-season markets are the New Jersey Giant and Cobbler in New York and the Minnesota Early Ohio in Chicago and Minneapolis.

From October onward the late crop holds the market and the prominent lines are Wisconsin, Minnesota, and Michigan No. 1 round whites, and the Colorado and Idaho round whites in Chicago and other great western markets; New York No. 1 round whites in New York; and the Maine Green Mountain in New York and Boston.

LEARNING BY USING.

Expertness in market judgment may be gained only by practice day after day and season after season. One soon learns to look for certain price changes under given conditions. Thus, a long-continued rise is often followed by dullness and hesitation at the top, then a sharp decline, and finally a partial recovery. Declining prices usually occur as shipments reach height, with a recovery and advance after the height of the movement is over. When active buying demand is reported in leading markets after long decline and dullness, a sharp rise often follows. A city quoting high prices may soon quote lowest on the list because of the large supplies likely to be diverted to that market, but cities having no large neighboring supply may quote higher prices than other markets for a considerable time when car-lot arrivals are light.

Extreme weather, either hot, cold, or stormy, may interfere with quantity or quality of supplies and cause active but short-lived fluctuations in price, and so with scores of price movements in which the reader of market reports soon becomes well versed in connection with the markets in which he is interested.

The practiced reader glances over the daily report, noting which markets show changes in price and the reason why as indicated by what the report says about the supply and demand, the number of cars on track, and the number reported shipped from States supplying these markets. He attaches most importance to changes in leading markets like Chicago and New York. He glances over the shipping-point news at Waupaca, Greeley, Rochester, or Presque Isle to see how country prices and conditions compare with changes in the corresponding city markets.

He goes over the underlying conditions with the aid of the car-lot summary, weekly reviews, and special articles, if the main facts are not already in mind. He notes the size of the crop and the

amount shipped from each State for the season to date. He observes carefully the attitude of growers, buyers, and shippers; whether anxious to trade or holding back. He takes into account the supply of empty cars, whether abundant or if shortage exists, and the weather conditions, whether favorable for rapid and safe transportation or the opposite. If the new southern crop is about ready or beginning to compete, he takes that into account—its size, condition, quality, and location—and last, having the situation in mind in all its essential aspects, he forms his own judgment of the probable course of the market.

In general, the man who keeps the main facts in mind and who learns to read the meaning of prices almost at a glance has a definite advantage in buying or selling. The larger the number who are well informed on prices and conditions, the more uniform will prices tend to become in all sections and throughout the season, because all buying, selling, or holding based on knowledge of actual conditions tends to equalize prices and thus in the long run to benefit all. When many thousands of sellers and buyers are equally well informed, there is little opportunity for a few to gain undue advantage.

THE USUAL COURSE OF THE MARKET.

The long range, general behavior of the potato market is much like that for other staple fruits and vegetables which have a shipping season continuing throughout the winter. There is usually a time of low prices during the main harvesting season, followed by more or less recovery, lasting perhaps until near the end of the calendar year. Then comes an irregular course throughout the winter, depending partly on conditions of weather and transportation, and finally a new movement in the spring either up or down, according to the supply on hand when hauling and shipping conditions are favorable and the active late movement begins.

WINTER TREND UNCERTAIN.

Aside from two or three of the war-time years, the chances of rise or decline between fall and spring appear about equal. Of the 11 years 1910 to 1920, inclusive, five have shown losses and six have shown gains. The only pre-war season of the series showing a great advance was the one following the very short crop of 1911, when the gain was \$1.28 per 100 pounds between October and March. In 1919-20 old potatoes advanced nearly \$3 per 100 pounds from October to March. This gain alone raises the average nearly 30 cents for the 11-year series.

Declines have been less extreme than the two or three spectacular advances. The great decline of 60 cents in the 1920-21 season was exceeded only in the record crop season of 1917-18, when the price dropped 88 cents from October to March. The decline during the third largest crop season, that of 1912-13, was 29 cents during the six months. Taking the five principal war-time seasons by themselves, the average gain was 26 cents from October to April, but three of the five seasons show declines. The relation between production and prices is notable throughout.

DEALERS' HOLDINGS.

An estimate of the proportion of potato stocks held by dealers the first of the year is included in the official report of January stock on hand.

Apparently nearly half of the dealers' holdings are in possession of wholesalers, over one-third are held by retailers, while, about one-sixth are in warehouses and miscellaneous storage, as shown in Figure 7.

The extent of dealers' holdings shows in general their real opinion in regard to the future of the market. It appears that in many instances the dealers' market position thus indicated has been borne out by the course of prices during the last part of the season.

During the period covered by Figure 8 potato prices for the month of March advanced usually as compared with the December price whenever the stocks held by dealers were very much in excess of 20 per cent of the total stocks on January 1. When the stocks held by dealers were very much below 20 per cent of such total stocks, the March prices are shown to have been below the December prices. When the stocks held by dealers were close to 20 per cent, the price

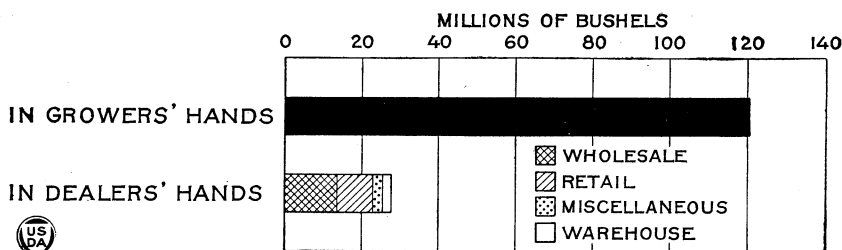


FIG. 7.—Holdings of the January potato stocks. Showing average proportions held by growers and the various classes of dealers. Based on special reports to the United States Department of Agriculture for January 1, 1917, and January 1, 1918.

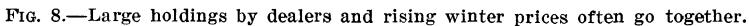
trend varied. However, the March prices rose to some extent in all but one or two of these close years.

The practical conclusion is that growers may fairly take into account the plain eagerness or reluctance of long-experienced dealers in buying potatoes during the early part of the season. If they seem glad to buy all they can get at the going prices, they evidently expect the market will go up. If they hold off from buying, a lack of confidence is shown. If the January report shows that the dealers have bought much above or much below 20 per cent of the supply, their feeling as a group shows plainly in the figures. Those indications should help the grower more or less in forming his judgment regarding the best time to sell.

A GLANCE AT RECENT MARKET TREND.

The spring of 1917 witnessed extreme shortage and high prices following the very light crop of 1916, but the large supply of early potatoes brought down the price rapidly and new stock started around \$2 per 100 pounds. The estimated main crop of 1917 was the largest on record up to that time. Shipments were heavy after

The 1918-19 season, except for a late spring rise and less irregularity of price range in winter, was in a general way much like the 1917-18 season. There were heavy crops in both years. The general course of the market for the main crop may be illustrated by the jobbing and car-lot prices of Wisconsin and Minnesota stock, which sold in Chicago late in October at \$1.75 to \$1.90 per 100 pounds and declined to \$1.50 to \$1.60 in the middle of November, recovered to \$1.90 to \$2 by January 14, and closed late in June at \$1.25 to \$1.50. Thus the market during the season showed four leading price move-



The 1921-22 season was exceptional in the fact that prices tended mainly downward, although the crop was estimated below average. Actually the harvested crop was large in some sections. The important shipping States—Maine, Minnesota, North Dakota, Colo-

rado, and Idaho—had a large surplus and the car-lot movement was heavy to the States where shortage existed. Prices were fairly steady the first three months, with the average about \$2 per 100 pounds in large shipping markets. In the East prices advanced in January, but after that month the tendency was downward under the pressure of heavy supplies, although at the lowest points, around \$1.50 per 100 pounds in the spring, the price was at least 50 per cent above the level at the corresponding time in 1921.

A crop of record-breaking size in 1922-23 was responsible for a generally low level of prices. Production was abundant in practically all important regions and the supply exceeded the demand. Prices paid to farmers ranged, much of the time, as low as 25 cents per 100 pounds in the far West and 75 cents in the East. City wholesale prices often fell below \$1 per 100 pounds in midwestern markets, but ranged somewhat higher in the East, at times exceeding \$1.50.

METHODS IN COUNTRY MARKETS.

VARIETIES HANDLED.

The most prominent main-crop varieties are of the round white type, including Rural, Cobbler, Russet-Rural, McCormick, and Pearl. The Green Mountain is rather of the long white type, but is often classed commercially with the round whites, or quoted by itself as a variety. Burbank, Russet-Burbank, American Giant, and White Star are more strictly of the long white type. Red or tinted varieties, including Early Rose, Early Ohio, King, and Garnet, are not important in the late crop of most shipping sections. The round white class is representative of the great northern potato section. It comprises the bulk of sales in many large markets and is often taken as the index of the general market.

Comparatively few of the many varieties of potatoes are of much commercial importance. Growers in commercial sections have found it best to confine their planting to one or two varieties which are best adapted to their soil and climate and most in demand in their consuming markets.

SUCCESS DEPENDS ON GRADING.

In the marketing process, the handling of potatoes at the shipping point is plainly one of the main items in deciding how the potatoes from one section shall stand in the consuming market in competition with those from another section. Upon the extent to which growers realize this connection depends the degree of care exercised at the shipping point.

Within the last few years the grading of the crop has come to be considered fundamental to commercial handling. Grading according to accepted specifications checks wasteful and unfair practice between shippers and receivers and is a protection to consumers as to quality and size. Careful grading can prevent many disputes and heavy losses to shippers. Such losses have always reacted to the detriment of growers. By lessening the element of chance grading does much toward reducing the margin that must be allowed

between the price paid the grower and the price received by the shipper.

State and Federal cooperative inspection service at shipping points has been established in California, Washington, Montana, Idaho, Utah, North Dakota, South Dakota, Colorado, Missouri, Maine, New Jersey, Wisconsin, New York, and Pennsylvania. Many shipping organizations have their own grades and hire their own inspectors to insure the uniformity of stock shipped under their various marks. Shippers in most sections of the main-crop States have voluntarily adopted the United States standard grades for potatoes, and stock that is not shipped "field run" is graded as U. S. No. 1 or U. S. No. 2, these widely adopted terms having proved especially convenient in quoting. Potatoes shipped "field run" are usually sold as such, but at times adverse market conditions will require them to be graded at the market end before they can be sold.

TABLE 2.—*Tabulated comparison of United States potato grades.*

| Grade. | Minimum diameter. | Tolerance for under size. | Tolerance for defects. | Tolerance for soft rot, decay (included in "Tol. for defects"). | Frost injury and decay. | Second growth and growth cracks badly misshapen. | Dirt, foreign matter, sunburn, hollow heart, cuts, scab, blight, dry-rot, damage by insects or mechanical means. |
|-----------|--------------------------------------------|---------------------------|------------------------|-----------------------------------------------------------------|-------------------------|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| No. 1.... | <i>Inches.</i> 1½ (round) 1¾ (long). | <i>Per cent.</i> 5 | <i>Per cent.</i> 6 | <i>Per cent.</i> 2 | Free.... | Free..... | Free. |
| No. 2.... | 1½..... | 5 | 6 | 2 | Free.... | No restrictions.. | Free from serious damage. |

Additional grades not yet extensively used are: U. S. No. 1 Small, which is designed for potatoes from 1½ to 1¾ inches in diameter—the regular No. 1 grade except in size, and U. S. Fancy No. 1, to consist of potatoes of one variety which are mature, well-shaped, free from freezing injury, soft rot, dirt or other foreign matter, sunburn, second growth, growth cracks, hollow heart, cuts, scab, blight, dry-rot, disease, insect or mechanical injury, and other defects. The range in size must be stated in terms of least or greatest thickness or weight following the grade name, but in no case must the diameter be less than 2 inches.

For the main crop as a whole grading in the field is a rare practice. Growers who own graders usually operate them in their barns or storage cellars, the potatoes are stored as dug and are graded as they are hauled to the track. Those who do not have graders must haul their stock to the track and sell at a lower price as "field run" or wait while the buyer runs it over his grader in the car or warehouse, receiving pay for those accepted and hauling the culls back to the farm.

Potatoes graded and sacked on the farm are subjected to much less cutting and bruising than those which, in addition to the initial handling on the farm, are forked into a wagon, then scooped into a warehouse, or perhaps thrown into a car and again scooped to the ends to be shipped in bulk. Too much is expected of the skin of the potatoes, and they are often treated almost like so much coal.

BASES OF SALE.

It is hard to classify the numerous bases of sale on which potatoes change hands in producing sections. At the same shipping point, for instance, one grower may load a car and sell it to a track buyer, or sell it by wire to a city dealer, or consign it to a broker. Another may haul his potatoes to the track and sell to a warehouseman, or to a dealer loading a car, who may have his market connections or may resell it at the shipping point. Still another may sell his crop "in the dirt" before it is matured, to a dealer who will dig, sack, and resell it before it is shipped.

But it is possible to make some statement as to the prevailing basis of the final transaction in the various shipping sections. As a rule, in well-established commercial districts that ship a dependable grade, dealers make most of their sales by wire on a delivered basis or "f. o. b. usual terms," the price being agreed upon before shipment, but inspection for grade being allowed at destination before acceptance. The "cash-track" basis prevails mostly in sections where the grade is not certain, but sales on this basis are made in other sections when the demand is particularly active.

As a rule, there is a difference of from 15 to 30 cents per 100 pounds between these two basis of sale at any given shipping point, the advantage being allowed to the cash buyer, who assumes ownership and responsibility for the shipment at the point of origin. Consignment is often resorted to in districts where strong associations have permanent market connections or whenever the uncertain market with poor demand and the perishable nature of the stock are important factors.

BULK STOCK OFTEN HIGHER THAN SACKED.

Minnesota, Michigan, and Wisconsin stock on the Chicago market is often quoted from 5 to 20 cents higher per 100 pounds in bulk than it is in sacks, notwithstanding the fact that sacks cost during the last few years from 6 to 18 cents each. The reason is that when buying on the "car-lot outweigh" basis of sale, the receiver can see what he is getting. He is permitted to sort out the poor potatoes, paying only for what he hauls over the scales. The culls may be a total loss, but sometimes are sold for about one-third the price paid for No. 1 potatoes. Resorting of sacked stock is rarely allowed, and for this reason it is commonly understood that bulk potatoes from the North Central States are more carefully graded at the shipping point than those in sacks.

Some dealers prefer bulk to sacked stock, as they have a select trade and can not be sure of satisfying their trade unless the stock is sacked under their own supervision. Of course, if shippers always put up good sacked stock it would be only a question of time before there would be no demand for potatoes in bulk. It is but reasonable to suppose that if the buyer could get what he wants in sacked stock he would not go to the expense of putting up bulk stock in sacks, as the cost per car outside of sacks will average around \$35.

During a period of dull market conditions, bulk stock may take a position much different from that occupied on a steady or firm market. Buyers then are more disposed to cull heavily and sellers

are less inclined to object to heavy culling. It is understood that bulk cars have shrunk as much as 5,000 pounds by culling, whereas in sacks there is no such loss. Not many cars of potatoes in bulk, however, show such shrinkage. In fact, many cars of bulk stock are unloaded with no culls in evidence when the unloading is completed. The difference is merely that in the case of the heavy shrinkages the shipper put his culls in the car and paid the freight, only to have them dumped out upon arrival, while the more careful and experienced shipper took out the culls before loading.

It should be borne in mind that cars of bulk stock are frequently held on the team track at the terminal market from one to two days longer than cars of sacked potatoes because of the time required for sacking the stock. This frequently creates demurrage charges, which must be taken into account in arriving at the net returns from the two classes of stock.

Members of the city potato trade express the opinion that it would be to the general interest of the industry if shippers would put up sacked stock, but qualify this statement by saying that sacked stock should not contain potatoes that ordinarily would be thrown out as culls from a car of bulk. It is believed that if the shipper would sort and pack consistently by established grades, the trade would soon come to know that by examining a few sacks the general quality and condition could be determined and they would be assured of getting better stock than is now generally shipped in sacks.

SACKS IN USE.

Organized shippers in most main-crop sections are making greater efforts each year to use only new sacks for their potato shipments. Realizing the value of the appearance of the package, an association in Colorado has made it a rule for all dealers to specify "new bags" or "old bags" when making quotations.

In many shipping sections of the Western and Central States the 120-pound sack is the one in most common use. The 150-pound sack is used in Wisconsin, Minnesota, Michigan, Kentucky, and in most of the Eastern States; but New Jersey and Maine, of the eastern group, use the 165-pound sack. The percentage of the crop shipped in bulk ranges from 10 per cent in Michigan to 40 per cent in Nebraska and even as high as 60 per cent in New York and Maine, and varies with the demands of the consuming market and the availability of containers. The use of 150-pound sacks began in northern Maine in 1921-22.

On account of the high price of new bags in 1919 and 1920 (15 to 18 cents), second-hand bags of every size and description were used at shipping points. Perhaps the best appearing of these was the second-hand wheat bag, common in some of the Western States. This bag, used once for grain, was clean and bright, and held about 120 pounds. The cost was 12 cents. A fertilizer bag holding 100 pounds is a second-hand package commonly used for Maine potatoes in bagging bulk stock at receiving points.

TRANSPORTATION.

Common box cars are used for the main crop marketed in the fall until the carriers require the use of refrigerator or lined box

cars. The date of beginning, varying with the sections, is between the first week of October and the first week of November. In 1919 and 1920, the cost of lining a box car with false floor and sides was from \$40 to \$60, but the shortage of refrigerators made it necessary for a great many shippers to go to this extra expense. The double walls of the refrigerator cars make it safe to ship potatoes in them

without a heater, while the temperature stays above zero, but at lower temperatures either an oil "monkey stove" is placed in each ice bunker or a coal stove is installed in the center of the car, as shown in Figure 9. In Maine the carriers supply heated cars for shipments to stations named in advance. These cars are equipped with heaters and oil tanks and the carrier guarantees frost-free delivery of stock shipped in them.

The minimum load for unheated cars allowed by carriers varies considerably with different sections. It is usually 30,000 pounds in the South and West, and generally 36,000 pounds in the Central and Eastern sections, but in a few districts is as high as 45,000 pounds, which is the minimum for some types of cars in

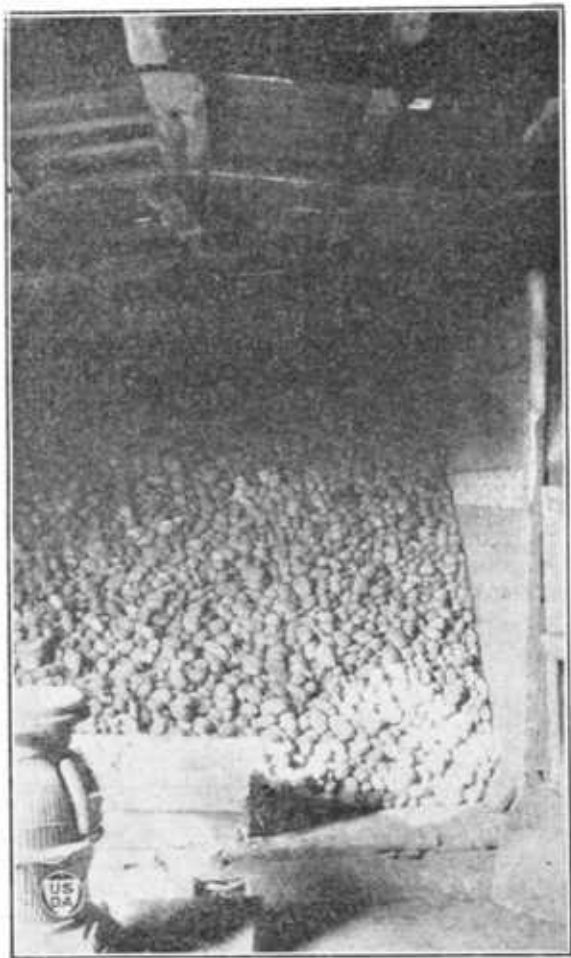


FIG. 9.—A partly loaded car equipped with heater.

Maine and Michigan. Most shippers load from 1,000 to 3,000 pounds above the fixed minimum, but the freight charge is based on the fixed minimum in cases where the load falls below it. Heaviest loading is practiced at times of the year when it is neither necessary to ice the cars nor to heat them. Provision for the circulation of cold or warm air requires special systems of loading.

PROMINENT SHIPPING SECTIONS.

Nine regions stand out prominently as important shipping districts for late potatoes: Greeley, Colo., Idaho Falls, Idaho, the Delta Region, Calif., Red River Valley, Minn., Waupaca, Wis., Grand Rapids, Mich., western New York, Allentown, Pa., and Aroostook County, Me. Figure 10 shows the sections in graphic form.

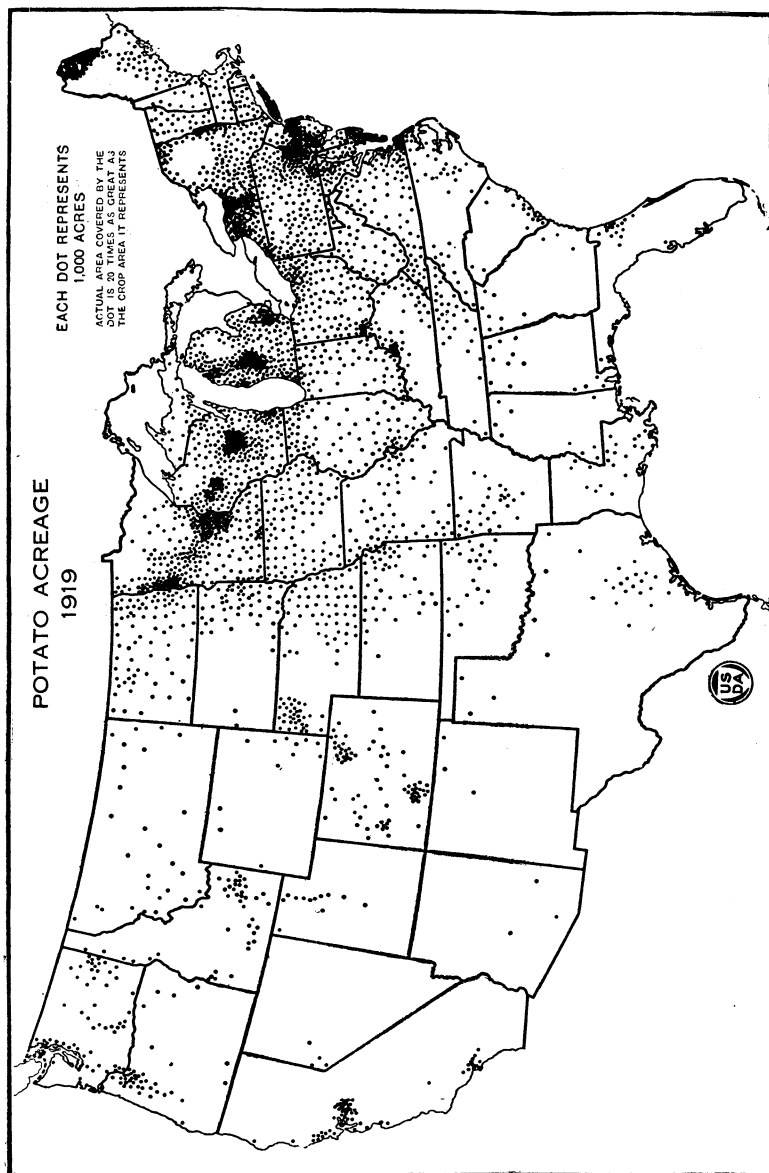


FIG. 10.—Principal potato-producing sections indicated by potato acreage.

Greeley, Colo.—The territory in Weld, Larimer, and Adams counties, centering around Greeley is the most important potato district in Colorado, shipping about 50 per cent of the movement from that State. The San Luis Valley and the Western Slope are two other important districts of the State.

A large part of the Greeley district is irrigated land. The Early Ohio is raised in a small way for an early crop; the Rural and Pearl varieties make up the main crop. The growers sort their stock according to the United States grade specifications and sell it sacked, for cash, by wagonloads at warehouse or by carloads. Most winter storing is in track warehouses. Local dealers are well organized for the promotion of better shipping facilities. Their sales are mostly on a delivered basis. In other Colorado districts the majority of sales made by the growers are on the basis of carloads, rather than wagonloads, and the Farmers' Equity Association and the Farmers' Union handle a considerable number of shipments.

Idaho Falls, Idaho.—The Idaho Falls district, lying within the upper Snake River Valley near the eastern boundary of Idaho, is the most important potato-raising district of that State. Twin Falls and Caldwell are centers of the potato trade for two other important districts.

The Rural and the Russet-Burbank are the principal varieties in the Idaho Falls district. The commercial crop is grown under irrigation. The potatoes are dug with elevator diggers, and power-operated screens are used in grading. The United States grade specifications are followed. Storing is done mostly on the farms in pits or cellars. The winter weather seldom prevents hauling, and the stock is usually loaded from the wagon directly into the cars. The grower sells his wagonload for cash at the car door, and the dealer sells the carload by wire or consigns it to market connections. There are two cooperative organizations shipping for the account of the farmers.

Nearly all shipments are made in refrigerator cars. Although potatoes from Idaho go mostly to points in Texas, Oklahoma, Kansas, and Missouri, because of their exceptionally high quality considerable shipments are sent to Chicago, and some cars go as far east as Pittsburgh. In the markets they usually bring a premium of from 25 to 50 cents per 100 pounds over stock from other districts.

Delta Region, Calif.—The Delta country of California, where the greater percentage of California's potato crop is grown, is at the junction of the San Joaquin and Sacramento Rivers near Stockton. In the past, practically all of this land was flooded during periods of high water and almost nothing grew on it except tule. This bottom land, the soil of which is nearly all of a peaty nature, has been reclaimed by means of dykes and now is one of the richest agricultural sections in the United States. The area is divided into islands by bayous and sloughs out of which has been dredged the earth for building the dykes around the islands.

Long potatoes belonging to the Burbank group are grown almost exclusively. The Burbank variety produces heavily in this section and the trade supplied from this territory expects and prefers them. The sacked potatoes are hauled to the river bank, where they are placed on boats or barges and transported to Stockton, Antioch, San Francisco, or other places, and loaded into cars for shipment.

Growers sell their potatoes by the sack, delivered at the river bank. While the sacks are not even weights, it is understood that they must contain 116 pounds. The prevailing basis of sale by dealers to the trade is by the 100 pounds.

Delta potatoes are marketed chiefly in San Francisco, Los Angeles, and other California cities, with a small percentage going to Arizona, New Mexico, and Texas. Early in the season a few go to the Northwest.

Red River Valley, Minn.—Moorehead, in Clay County, Minn., is the old business center for the potato industry of the Red River Valley, which extends for nearly 200 miles north and south, including much territory in North Dakota. Ninety per cent of the product of the valley is the Red River Ohio, and the rest is mostly the Irish Cobbler. Unlike the other potato districts of Minnesota, the soil in the Red River Valley is a black loam and produces a particularly fine quality of the Early Ohio variety which has come to be known as the "Red River Ohio." Elevator diggers are used in harvesting and most of the growers have graders on their farms and grade their potatoes either in the field at digging time or in their storehouses before they are hauled to the track. United States grade specifications are followed, but much of the stock is shipped "partly graded." From 10 to 25 per cent of the crop is shipped in bulk. Normally a large part of the crop shipped in the fall is bought from the growers for cash at track by wagonload or carload, but during the winter most of it is sold to warehousemen, who make their sales "f. o. b. usual terms." The Chicago market is the controlling factor in the shipping-point price.

Waupaca, Wis.—Waupaca, Waushara, Portage, and Marathon Counties form the heaviest potato-shipping district of Wisconsin. The town of Waupaca is headquarters for the trade.

The Rural and Green Mountain varieties, termed "round whites" by the trade, make up the commercial table crop. A comparatively small acreage is given to raising the Bliss Triumph, Irish Cobbler, Early Rose, and Early Ohio varieties for seed stock. Elevator diggers are used in harvesting, and the potatoes are picked from the field by hand. Such combinations as have been tried thus far of machine picker and digger have proved unsuccessful. Most of the growers store their potatoes field-run on the farm, but many store in track warehouses belonging to dealers. Virtually the whole crop is sold in bulk by wagonloads for cash at warehouse. The dealers grade the stock as it is unloaded from the wagons. Unless marked "ungraded," the State requires that each sack be tagged to indicate one of the United States grades or the "Badger," which is an extra fancy State grade and practically the same as the U. S. Fancy grade. The State supplies men for shipping point inspection, upon request. Dealers make most sales on a delivered basis. There is one organization shipping for the account of the growers. The Chicago market takes most of the output from the State and the price at Wisconsin points is governed chiefly by the condition of that market.

Grand Rapids, Mich.—The Grand Rapids section is one of the principal potato-shipping regions in Michigan, with Greenville the largest shipping station. The Cadillac section is important, with Tustin and Cadillac as two of its largest shipping points.

The chief varieties raised are the Rural and the Russet-Rural, quoted commercially as "round whites." Machine diggers are used. The United States specifications are followed in grading. Most of the crop is sold in bulk to warehousemen, who sack and grade it, making their sales "f. o. b. usual terms." From 10 to 25 per cent of the shipments are made in bulk. The Michigan Potato Growers' Exchange, a cooperative organization, handles shipments for the growers for a fixed charge per 100 pounds.

Michigan enjoys a convenient distribution of its potatoes because of its location with respect to centers of population. Pittsburgh usually takes the largest number of shipments, and Chicago comes second. Other heavy receivers are Detroit and the Ohio cities.

Western New York.—The potato-growing counties of commercial importance in western New York are Steuben, Allegany, Wyoming, Livingston, Cattaraugus, Ontario, Monroe, and Wayne. Some of the dealers make their headquarters in Rochester, but most of them are located at outside shipping points.

The Rural is the principal variety grown. The other commercial varieties are classed with the Rural as round whites. Elevator diggers are commonly used and the potatoes are picked from the field by hand. There are not as many warehouses in western New York as in the potato districts of Minnesota, Wisconsin, or Michigan. Some dealers buy and store in warehouses, but most storing is done by the growers themselves in cellars on the farms, and as a general rule the crop is "farmer-owned" through the larger part of the season. Growers sell by the bushel rather than on the 100-pound basis. The crop is hauled field-run and graded by the dealers according to United States grade specifications. The majority of sales are made by wire on a delivered basis. Most of the early shipments move in bulk, but during cold weather 150-pound sacks are used. The crop is all marketed east of the Mississippi River, the heaviest receivers being New York City, Philadelphia, Baltimore, Pittsburgh, and Newark.

Allentown, Pa.—In Lehigh County the potato industry is more concentrated than in any other district of Pennsylvania. This county forms the center of the most important producing region of the State, which includes all of Lehigh County and parts of Northampton, Carbon, Schuylkill, and Berks Counties.

The commercial crop of this district is 90 per cent Rurals and the rest Irish Cobblers. Practically all the stock is put over grading machines either at the farm or at the cars when being loaded. Most of the potatoes are shipped in bulk, but a few growers put them up in sacks of 100 to 150 pounds.

The greater part of the sales in the district are made to local buyers on a basis of cash to growers at country loading points. Usually the sales are made at a price per bushel in bulk. A few traveling buyers operate throughout the district, but their tonnage is small. The Farmers' Exchange handles a considerable number of shipments. In the region of Macungie, most shipments are consigned to commission houses in Philadelphia. Because of the more careful grading practiced there, that locality has made for its potatoes, a reputation which brings the growers a premium over other potatoes sold in Philadelphia.

Most shipments from the district as a whole go to Philadelphia. Other important markets are New York City and Pittsburgh.

Aroostook County, Me.—The leading potato district of Maine lies mostly within Aroostook County. The most important shipping points are Caribou, Presque Isle, Fort Fairfield, and Houlton.

The Green Mountain, Irish Cobbler, and Spaulding Rose are the principal varieties raised for table stock. Maine growers also raise a large amount of seed stock, of which the Green Mountain, Irish Cobbler, Spaulding Rose, Bliss Triumph, and Aroostook County Prize are the important varieties. The last two kinds are grown mostly in the northern part of the county. The Irish Cobbler seed goes mostly to the South Atlantic potato States, the Spaulding Rose goes to Florida, and the Aroostook County Prize goes to New Jersey, where it is called the American Giant.

Machine diggers are used, and the potatoes are picked from the field into baskets and then dumped into barrels. Most storing is in cellars on the farms. The stock is usually graded over a hand "rack" and hauled to the track warehouses in barrels and sold by barrel measure (165 pounds) rather than by weight. There are several starch factories in the county which buy the culls. They buy the No. 2's as well when there is no demand for them as table stock, paying one-third to one-half the market price for No. 1's. A large percentage of the shipments is in bulk to be sold at city ware-

TABLE 3.—Outline of prominent late-potato shipping districts.

| State or district. | Representative shipping center (field station). | Season opens. | Season ends. | Principal varieties. | How put up. | Principal consuming territory. |
|---------------------|----------------------------------------------------|------------------|--------------|-------------------------------------------|-----------------------------------|------------------------------------------------------------|
| Colorado..... | Carbondale, Greeley, Monte Vista, Montrose, Delta. | Aug. 1 | June 30 | Rural, Pearl, Russet-Burbank, Early Ohio. | 120-pound sacks. | Colorado, Texas, Arizona, New Mexico. |
| Idaho..... | Caldwell, Idaho Falls. | Aug. 1, Sept. 1. | ...do.... | Rural, Russet-Burbank. |do..... | Texas, Oklahoma, Kansas, Missouri |
| California..... | Stockton..... | June 1 | May 31 | Burbank. | 116-120 pound sacks. | California, Texas, Arizona, New Mexico, Pacific Northwest. |
| Washington.. | Yakima..... | Sept. 1 | June 30 | Russet-Burbank. | 120-pound sacks. | |
| Wisconsin.... | Waupaca..... | Aug. 1 | ...do.... | Rural, Green Mountain. | Bulk and 150-pound sacks. | Chicago, Middle West. |
| Minnesota.... | Moorehead, Minneapolis. | ...do.... | ...do.... | Early Ohio, Rural. | Bulk, 120-pound, 150-pound sacks. | Do. |
| Michigan..... | Grand Rapids, Cadillac. | Aug. 15 | ...do.... | Rural, Russet-Rural. | Bulk and 150-pound sacks. | Pittsburgh, Chicago, Middle West. |
| Nebraska.... | Alliance..... | Sept. 1 | May 31 | Early Ohio.... | Bulk and 100-pound sacks. | Nebraska, Missouri, Kansas, South Dakota. |
| New Jersey (north). | Freehold..... | Aug. 1 | ...do.... | American Giant, Green Mountain. | Bulk, 150-pound, 165-pound sacks. | Pennsylvania, New York, New Jersey, Ohio. |
| Pennsylvania | Allentown.... | ...do.... | June 30 | Rural..... | Bulk, 100-pound, 150-pound sacks. | Philadelphia, New York, Pittsburgh. |
| Western New York. | Rochester..... | Sept. 1 | July 15 |do..... | Bulk and 150-pound sacks. | New York and other eastern markets. |
| Maine..... | Presque Isle... | Sept. 15 | June 30 | Green Mountain, Irish Cobbler. | Bulk, 150-pound, 165-pound sacks. | Boston, New England, New York. |

houses or sacked there. Sales of Maine stock on the Boston market are mostly in 100-pound sacks, which are put up in the receiving yards near the city. At New York City it is sold on a 180-pound bulk basis or in 150 and 165 pound sacks. Most of the business is transacted on a delivered basis. The size of the New Jersey crop is an important factor in making the price of the fall shipments from Maine. Boston is by far the heaviest receiver of Maine table stock, and New York is next in importance. Other important markets are the New England and Atlantic Coast cities. (See Table 3.)

MARKET PRACTICE AT A NORTHERN SHIPPING POINT.

A description of what takes place during an average day in the potato season at the important shipping point of Waupaca, Wis., will give an idea of the activities at most of the shipping points in the Northern States.

At any of the established northern shipping points during times of moderate or slow demand the price depends upon the condition of the market most important to the district in question, and upon the size of the movement the day before. The volume of inquiry as indicating market tone is also considered. Each morning from 10 to 25 dealers at Waupaca and points within a radius of 50 miles call up the Waupaca office of the Bureau of Agricultural Economics. They get the Chicago market information as soon as it comes over the wire, and the number of cars shipped the previous day for the country as a whole and from the important Northern States separately. On this information they form an idea of the supplies for their principal markets. The probable price is then estimated, the basis being approximately the Chicago market less the freight and the dealer's margin for handling. As a rule, the dealer's margin is narrower in the fall than in the winter months because of the lower expense of handling immediately and shipping without heating, and because the stock held for spring shipment must be carried and stored for several months. Competition among resident dealers and track buyers during the fall months also tends toward a narrower margin by raising the growers' price.

Growers must haul from 5 to 15 miles. Because of the risk of freezing at night it is the general practice to load the wagons in the morning, and the loads begin to arrive at the track about 9 a. m. Normally there is very little bidding for loads at Waupaca, but the established dealers have their lists of growers who haul to them regularly. The load is weighed on a wagon scale. A few growers haul in sacks to prevent bruising the stock, but practically no grading is done on the farms, and the sacks are emptied at the warehouse. One of these is shown in Figure 11. The potatoes are unloaded into a chute or upon a belt which carries them to a power-operated screen. The culls (and the No. 2's if the dealer is not buying No. 2's) are loaded into the wagon again, which is then weighed a second time to get the net weight of the potatoes accepted. If the grower is merely storing

with the dealer, he gets a receipt for his load; if he is selling, he gets cash.

In the better-equipped warehouses the potatoes, after being graded, are carried to overhead distributing runways, which may be adjusted to drop them into any one of the various storage bins. If it is the intention to hold the potatoes for some time, they are stored in bulk, as shrinkage and possible decay of some of the tubers make it impracticable to keep them long in sacks. Before shipping, sacked potatoes are tagged according to grade. For bulk shipments the grade must be stated on the invoice.

Virtually all cars handled by the resident dealers are loaded by their own men, as they prefer to do this rather than to depend upon the growers' comparatively limited experience in grading and packing. In freezing weather refrigerator cars are used for shipping,



FIG. 11.—A track warehouse in the Great Lakes region.

because of the protection afforded by their double walls. When there is a shortage of that equipment, some shippers use box cars fitted with a false floor and lined with lumber and building paper.

There are two arrangements for the protection of potato shipments between October 15 and April 15 on all roads west of Chicago. These arrangements are termed "shippers' protective service" and "carriers' protective service." Under "shippers' protective service" the charge, in addition to the freight rate, is only \$5 for the use of the refrigerator car. The railroad allows free transportation for a caretaker, or stoker, to the destination and back, and any lining or stoves used in the car are returned to the shipper at half rate. No guarantee of frost-free delivery is made. Under "carriers' protective service" the charge, in addition to the freight rate, is \$12 to \$18 per car, depending upon destination, and amounts to 4 to 6 cents per 100 pounds for the average haul. The railroad guarantees frost-free delivery. Usually an oil heater is placed in each bunker. The

employee in charge is instructed to close the vents when temperature reaches 32° F., start one heater at 20° F., and both heaters at zero.

Sales are made mostly by wire. When the market is strong and buyers eager to get potatoes the usual message is one asking the shipper to quote on a given variety f. o. b. or delivered at destination. The shipper quotes, and, if the other party confirms the price, the sale is considered closed and the car is shipped as directed, the telegram being kept as a record of the sale. When the market is dull and sales slow, many shippers wire to a number of their trade connections, usually by night letter, offering a list of quotations. If the trade "comes back" the following morning, the shipper confirms the quotation in question and the sale is closed.

It is a common sight, especially in times of slow movement, to see several representatives of different railroads visiting the shippers of the town, soliciting business for their respective companies. Most of the railroads represented do not touch the shipping point itself, but they may get more or less business, according to how the shipments are routed to their respective destinations. The difference in any two routings to one destination is largely a matter of promptness of delivery and of treatment by the carrier in the adjustment of claims, the tariff to a given destination over one road being the same as over another, regardless of any difference in distance.

COUNTRY MARKETS IN WESTERN NEW YORK.

The day's program in the shipping section in western New York near Rochester is representative in a general way of the operations in the eastern potato country.

While Rochester itself is not a shipping point, it is considered a center of the potato trade for western New York and is centrally located with reference to the principal producing areas. Monroe County, which includes Rochester, is the largest potato-producing county in the section. Some of the largest dealers are located in that city. In the office of a dealer who handles at least three to five carloads a day, telegrams and price inquiries are being received early in the day. So far, perhaps, inquiry is active and business looks promising. Long-distance calls are coming in from points to which he ships, and it is reported that supplies are light, the demand increasing, and market firm with prices advancing slightly. Apparently a general price advance may occur.

However, not the least important consideration at the time is the number of cars being shipped to markets that draw supplies from this section and the total movement from each competitive area. If these other regions are shipping heavily, the market will bear close scrutiny. The local representative of the Bureau of Agricultural Economics is called and information is obtained as to movement and destination on the previous day. The dealer concludes that supplies in the city markets are light, shipments are light, and there is an increasing demand and inquiry. His asking price is advanced and wire "feelers" are sent out to prospective customers.

If he is able to secure the advanced price and the market seems likely to hold strong for a few days, he telephones his buyers who are located in one or another of the principal producing areas, informing them as to the price per bushel to offer the growers. The

cost of sacks, labor, material for loading the car, plus a certain profit, is included in the buying price. In this section there seems to be much competition between the different buyers in the same town. Immediate necessity for stock required to complete orders, or for speculative purposes, often makes it possible for the grower to secure a premium for his potatoes.

Orders by telegraph comprise the bulk of sales by the dealers. Inquiries usually ask for a quotation on sacks or bulk f. o. b. destination. However, a few sales are made on the basis of 100-pound or 150-pound sacks f. o. b. shipping point. It has been found more satisfactory to quote prices per sack delivered or "f. o. b. usual terms." The dealer wires his price in response to the inquiry, and if the offer is accepted the deal is considered closed. Collection is usually made by means of bank draft. Some few shippers who deal with houses of long-established reputation or who trust to the honesty of receivers, ship "open" and receive returns through ordinary methods. Many of the dealers who handle potatoes also deal in other commodities, and in this way the expense for telephone and telegraph service is not chargeable in full to the one crop, and the expense incurred in securing information is considered well spent. The smaller dealers usually depend on price information and use as their gauge the official "Daily Market Reports" and the volume of letters or wires received. They strengthen their attitude whenever the inquiry becomes heavy and hold their stocks for all the market will bear.

The buyer has a warehouse and office usually on a railroad siding with facilities and machinery for grading and sorting. He does business by telephone with certain growers with whose stock he is familiar. News of any advance or decline in price travels swiftly; and if the growers are disposed to sell, haulings begin immediately. Prices to growers in a normal season remain fairly steady; for on an average changes are made not oftener than once a week.

If the stock has been already inspected by the buyer and terms arranged, the bulk potatoes are hauled to the warehouse, weighed, graded and sacked, and loaded aboard a car. Refrigerator or protected cars only are used during the cool months, and papering of the ordinary car is necessary.

Very few dealers in this section seem willing to let the growers do the grading and sorting. They claim that experience has taught them it is better to do this work carefully and by improved methods and machinery than to trust to the grower. Few growers have either the machinery or the lighting facilities to insure a good pack. Much trouble is experienced because many growers do the packing under such conditions that they are not able to inspect the potatoes closely and do not put up a reliable pack. While undoubtedly some cars are rejected at destinations for other causes, it is probable that most rejections are the direct result of poor grading.

In a season of heavy production dealers generally make no effort to store potatoes for even a short period; it is merely a case of hauling as the needs of the day's business demand. In such a season no buyer is willing to buy any reserve stock because the market, although fluctuating from week to week, is often on the downward grade.

A GLIMPSE OF CITY MARKETS.

As a rule city markets draw their main crop supplies mostly from the nearest large producing sections. Chicago and other midwestern cities receive potatoes chiefly from the Great Lakes region; eastern cities mostly from Maine, New York, New Jersey, and Pennsylvania; southern cities from the State due north; far western cities from the Intermountain region and Pacific coast shipping points. But in seasons of shortage Maine potatoes may go far west and south, or potatoes from Colorado and Idaho or from Washington may go to California or to eastern consuming sections. The source of supply of the chief cities is shown in Table 4.

TABLE 4.—Main-crop car-lot potato supplies of cities.

| Cities. | Average number unloads per year five-year average. | Origin of late car-lot supply. | Per cent of potato supply received from late-shipping sections. | Leading varieties or types main-crop receipts. |
|-------------------|----------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------|-------------------------------------------------|
| Boston..... | 1 8, 277 | Maine, New Brunswick | 79.8 | Maine Green Mountain Cobbler. |
| Buffalo..... | 1 1, 710 | New, York Michigan, Maine .. | 48.9 | Round white. |
| Chicago..... | 8, 924 | Wisconsin, Minnesota, Michigan, Idaho. | 75.7 | Round white, Russet, King, Burbank. |
| Cincinnati..... | 1, 395 | Michigan, Minnesota, Wisconsin. | 66.7 | Round white, Red River Ohio. |
| Cleveland..... | 1 1, 787 | Michigan, New York..... | 57.1 | Round and long white. |
| Columbus..... | 1 682 | Michigan, Minnesota..... | 69.8 | Round white, Early Ohio. |
| Detroit..... | 1, 472 | Michigan, Wisconsin, Canada .. | 60.7 | Round and long white. |
| Indianapolis..... | 1 1, 565 | Michigan, Wisconsin..... | 74 | Round white. |
| Kansas City..... | 1, 932 | Minnesota, Colorado, North Dakota, Nebraska, Idaho. | 82.4 | Minnesota Red River Ohio, Colorado round white. |
| Minneapolis..... | 673 | Minnesota, Wisconsin, Washington, Canada. | 91.1 | Round white, Early Ohio, Bliss. |
| New York City.... | 10, 155 | Maine, New York..... | 57.7 | Round white, Green Mountain. |
| Omaha..... | 1 932 | Nebraska, Minnesota..... | 90.1 | Early Ohio, Bliss Triumph. |
| Philadelphia..... | 3, 741 | Pennsylvania, New York..... | 52.9 | Round white, Giant, Cobbler. |
| Pittsburgh..... | 3, 541 | Michigan, New York, Wisconsin. | 74.7 | Irish Cobbler, round white. |
| St. Louis..... | 2, 461 | Wisconsin, Colorado, Minnesota, Idaho. | 84.9 | Round white and long white. |
| St. Paul..... | 308 | Minnesota, Wisconsin, Washington, Canada. | 89.8 | Round white, Early Ohio, Bliss. |
| Washington..... | 438 | New York, Michigan, Maine, Wisconsin. | 46.7 | Giant, Green Mountain, round white. |

¹ Less than five years.

A great distributing market like Chicago handles more or less stock from opposite ends of the country. It is one of the most active potato markets, and responds quickly to changes in general conditions of supply and demand, often showing earliest signs of coming developments in the trend of the general market. Shipping-point markets tributary to Chicago usually respond to Chicago market changes within 24 to 48 hours. Many sales in the Chicago market are in car lots. About one-fourth of the business is on a commission basis.

It is well to have car lots arrive about the middle of the week, as the accumulated supplies are heavy on Monday, while trading slows down the last part of the week. Sales are made on team tracks of the railroads. The buyer looks over the car, usually looking into a few sacks, if it is sacked stock, or digging down a foot or so if it

is bulk. If the car suits, he makes terms with the receiver, gets his sale ticket, brings in his trucks, and unloads the car. Each load is weighed on the railroad scales, and a copy of the scale ticket is given to the seller. Bulk stock is sacked in the car, the culls being sorted out. The buyer pays only for what goes into the sacks. Thus, a car of bulk stock may bring more per 100 pounds, as compared with sacked stock, but less for the car lot, because of the culls thrown out in sacking. The buyers at the car-lot market are mostly jobbers, who resell to such customers as provision dealers, hotels, and peddlers. The scene in the heart of the market district, Figure 12, suggests the activity prevailing in the process of distribution.

The St. Louis market price follows rather closely the market at Chicago, allowing for freight. Car-lot sales may be subject to



FIG. 12.—South Water Street Market, Chicago.

weighing and sorting, as at Chicago, or they may be transacted at invoice weight but at about 10 cents per 100 pounds less. If sales are to be delivered to buyers, 10 cents extra is charged. Most sales are of sacked stock. Another feature of the St. Louis potato market is the popularity of the 100 or 120 pound sacks, as compared with 150-pound sacks, favored in many middle western markets. Government inspection is often requested either by the seller or the buyer. Inspection certificates frequently forestall a lawsuit.

The Kansas City market seems to prefer northern potatoes rather than western stock. Large quantities of western potatoes, especially from Colorado, are diverted at Kansas City to southern markets. In general, the sales methods are like those of Chicago or St. Louis.

New York is the largest consuming market. It does not reship many car lots, but repacks small lots to supply dealers in near-by

towns and cities. Stock from Maine, New York State, and Canada usually sells at about the same price, but there is a decided preference for the Green Mountain variety. New York is a poor market for No. 2 grade. Buyers take away their potatoes, or pay receivers 10 to 15 cents per package for delivery. Sales are mostly from the railroad piers, some of which are shown in Figure 13. Unlike western markets, car-lot prices are the same as for jobbing sales.

Boston's late potato supply is chiefly from Maine and Canada. Nearly three-fourths is bulk stock from Maine and New Brunswick. Sales are made mostly to jobbers in Boston and adjoining cities. The same dealers sell in smaller lots to retailers, charging from 10 to 15 cents a bag more than the wholesale price at the yards in Charlestown. Practically all stock, including Canadian, is sold to conform to the United States grading rules. No. 2 stock is not wanted in the Boston market.

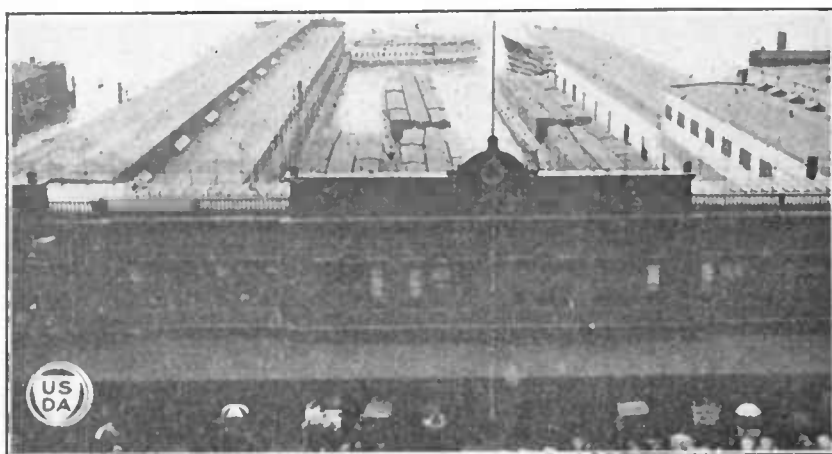


FIG. 13.—Piers along the Hudson where potatoes are unloaded.

Cities located in great producing sections depend much on supplies brought in from the farms by wagons and trucks. Such cities as Minneapolis, St. Paul, Rochester, and Buffalo are shipping centers rather than consuming centers for outside stock. Detroit is largely in this class, as it receives five-sixths of its supply from its own State. It receives practically no stock on consignment.

Most of the large handlers of potatoes in Cincinnati prefer to buy rather than to handle on commission; over four-fifths of the trade is by direct purchase at shipping points. The market prefers the 150-pound sack for white stock and 120-pound sacks for pink-skin potatoes.

The Cleveland market is much like that of Cincinnati, but sometimes pays a little more for good New Jersey or western potatoes than for northern stock, and does not favor dark-colored or semi-russet stock.

Pittsburgh draws much of its winter supply from Michigan, mostly of the round white class. There is little commission trade,

and a great deal of stock is reshipped to out-of-town points in large and small lots, thus creating one of the most active of the great city distribution centers as suggested by the illustration (Fig. 14). Omaha has special preference for Minnesota and North Dakota Red River Ohios, and for Idaho Netted Gems. Nebraska stock is now generally sold on grade and is received with increasing favor in this market.

The Washington (D. C.) market buys most of its winter stock through brokers or northern dealers, and takes considerable quantities of New York and northern potatoes.

The "bushel" basket trade in near-by stock is a prominent feature in Baltimore, superseding bushel boxes in that section. The contents of the basket weigh 50 to 56 pounds. Later in the season the round whites from western Maryland and western Pennsylvania are popular for their smoothness and good cooking and keeping qualities. Then



FIG. 14. — Pittsburgh potato market.

come shipments of northern round whites. Most sales are made by receivers or commission dealers in less than carlots.

In Philadelphia is a distinct class of dealers who handle only main-crop potatoes. Commission is 5 to 8 per cent, or so much per 100 pounds or per bushel. The chain stores are large buyers and some of their buying is direct from country shippers.

Some of the larger cities of the South are fairly active consuming sections for northern or western potatoes. Atlanta takes New Jersey stock in September, but throughout the winter draws from the North and West—sometimes from as far west as California, Colorado, and Idaho. Potatoes should not be consigned to southern cities unless through previous arrangement with the receiver. Such markets are easily oversupplied. Most sales are made through local brokers before the cars are shipped. Northern stock in 150-pound bags is the standard.

The Houston (Tex.) market has been estimated to take 2,000 to 2,500 cars of potatoes from Idaho, Colorado, California, and the Northwest.

New Orleans draws supplies from the North and the Northeast during the fall and winter.

California markets take outside supplies, mostly from Idaho and Oregon. San Francisco is a good hotel market, and there is a heavy demand for fancy grades, obtained by sorting potatoes on the dock or track.

MISTAKES OF SHIPPERS AND RECEIVERS.

Many of the losses to shippers result from poor grading and from careless handling and loading. Many complaints regarding inferior quality of main-crop potatoes come under some of the following heads: Undersize, mixed 1's and 2's, scab, rot, cuts, and bruises.



FIG. 15.—A southern wholesale potato market.

Several of the more troublesome defects are illustrated in Figure 16. Shippers in car lots as a rule lose heavily when a car must be discounted because of freezing injury or inferior quality. They lose not only the potatoes sorted out, but the amount chargeable to freight and the cost of labor in handling such stock.

A mixture of red and white varieties, or even of two types of white stock, is a common source of trouble at unloading points. In Boston, many shipments from Canadian towns contain a mixture of the Cobbler and Green Mountain. Receipts at Chicago from northern producing centers may include car lots of mixed red and white varieties. Such conditions involve a discount in the price, and in times of declining markets are frequently a basis for rejection of cars bought as one variety or type. Packed and loaded separately, either variety might command full price.

Red varieties of main-crop potatoes often sell at a considerable discount. Possibly the reason is that in former years several coarse,

watery types of potatoes, red in color, were sold in large quantities. They created a prejudice against the color, although several well-known varieties with pink or red skins are of excellent quality.

In the New York market, Maine sacked stock seems to have a slight preference over sacked stock from New York and New Jersey, owing principally to the varieties shipped from these sections. Several markets show disfavor toward No. 2 potatoes from any section.

Shipments for the middle western markets should be packed in 150-pound sacks in fall and winter, to avoid repacking and the errors in weight and shrinkage resulting from repeated handling. Important shipping sections in northern Maine are now using this pack to a limited extent for eastern markets.

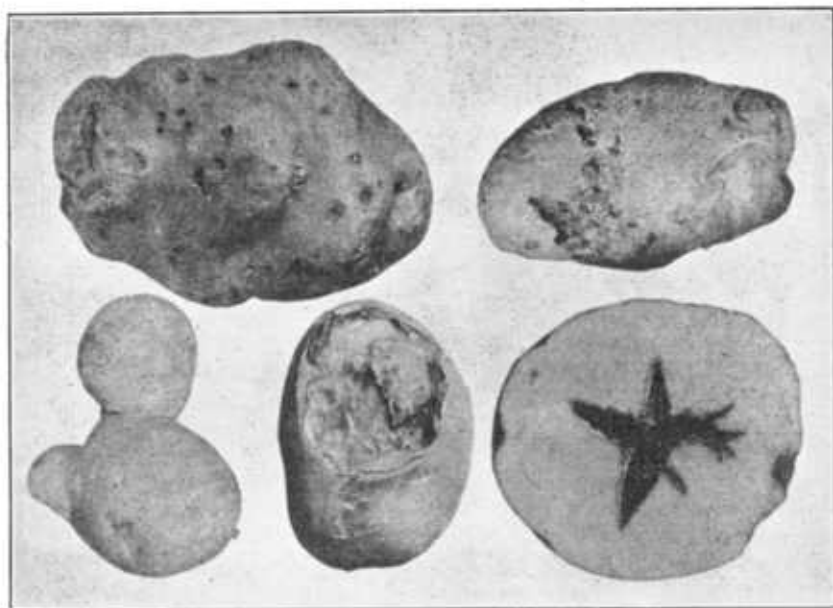


FIG. 16.—Common defects of main-crop stock. Upper row left to right: Wire worm and scab injury. Lower row left to right: Irregular second growth, late blight tuber rot, hollow heart.

A study of freight rates may suggest profitable changes in market destinations. Thus in cities in southern California the excess freight rate from shipping stations in the State of Washington confers an advantage on Idaho shipping points and makes the Idaho stock preferable when offered at the same price in producing sections. In eastern markets similar conditions often give an advantage to stock from near-by producing sections in New York State and Pennsylvania as compared with Maine or the Great Lakes region.

One class of mistakes, very costly to large handlers, may be considered as poor salesmanship—not knowing the proper time to sell or holding for a price higher than the stock is worth. The largest losses are likely to be incurred by those who do not keep thoroughly informed regarding all facts that tend to affect the market. Careless methods of buying and inspecting stock, the practice of

handling cheap, inferior grades and misrepresenting them, or holding them for the price of good stock—such ways have been the undoing of dealers in some markets.

A FEW CHIEF POINTS.

The main, or late crop of potatoes is shipped chiefly from the States along or near the northern border. About half the potato crop is sold; the rest is accounted for by waste, shrinkage, seed, and starch requirements, and home use. A little more than one-fourth of the average main crop is shipped to market in car lots or in their equivalent in bulk lots.

The practical question is when, where, and how to sell the commercial half of the crop. Prices seem closely related to production, which in turn depends on acreage and yield. Reports of heavy plantings in early sections suggest caution, especially if production was light the season before. A season of heavy planting often follows a season of light production and high prices. For this reason, it is unsafe to increase acreage heavily in the year following a high-price season, especially if early reports show that farmers in general are increasing their plantings; but supply and price depend on yield as well as on acreage, and the yield of the main crop can not be forecast until August or September.

An estimated yield above four bushels per capita has been usually followed by a season of low or falling prices, while a yield around three bushels per capita has been often followed by rising prices. For yields between these points the indications are not clear, but the general price tendencies during many such seasons intimate that in cases of doubt the chance of gain may be hardly worth the cost and risk of long storage.

The chief price-making factors are acreage, total supply, losses from rot, disease, or freezing, the demand, and the competition with imported potatoes or with the early crop. There are also fluctuating prices caused by weather and conditions of transportation.

Crop and market news supplied by the United States Department of Agriculture includes crop and market reports and summaries of many kinds published at eight field stations located in the prominent shipping sections and at about a dozen market stations, including the Washington office. These reports contain the necessary facts of production, condition, shipment, prices, demand, and quality.

By persistently using and comparing reports from day to day, and season after season, they become more and more useful in showing the potato holder when, how, and where to sell.

The general condition and course of the market is best indicated by the leading grades of the most important commercial varieties in the largest and most active markets.

The reader soon learns to look for certain price changes under given conditions and to detect the early signs of coming price movements.

Among the regular price developments to be looked for in average seasons is a comparatively low price at digging time with some gain as shipments decrease or when winter conditions begin, then several months of moderate ups and downs, and then another swing, upward or downward, with the opening of spring activity.

The proportion of stocks held by dealers on January 1 has often proved an indication of the course of the late winter and spring markets.

The whole matter of good marketing may be summed up under: (1) Careful planning from planting time to day of sale; (2) full use of the crop and market news; (3) good handling, grading, and loading; and (4) readiness to learn from the methods of other commercial potato sections.

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